

REMARKS

The Office action dated November 09, 2006, has been carefully reviewed and the foregoing amendments have been made in response thereto.

Claim 12 stands rejected under 35 U.S.C 112, first paragraph. The Office action states that Claim 12 contains subject matter not described in the specification in such a way to reasonably convey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention. The Office action says that limitation "there being no differential pressure across the plunger tending to displace the plunger axially" is unsupported by the specification. Each independent claim, claims 11, 12 and 13, has been amended to recite this limitation.

Respectfully, Figure 1 and paragraph 15 of the specification support the subject limitation. The specification describes with reference to Figure 1 a rod 62 having a passage that extends entirely along its length and a plunger 52 having a passage 66 that extends along its length aligned with passage 64 such that the bore 34 communicates through the passages 64 and 66 to the end cap 60. The specification states, "Rod 62 includes essential axial passage 64 that communicates with a central axially passage 66 through plunger 52 for equalizing pressure to facilitate movement of plunger 52 during opening and closing of valve 38. (p. 6, ll. 3-5) ...the end cap 60 may include a pressure transducer for monitoring fluid pressure within bore 34 through passages 64 and 66." (p. 6, ll. 6, 7) These sections of the specification and Figure 1 indicate that there is no pressure differential between bore 34 and the end cap 60 to displace the plunger axial because the end cap can sense the pressure in bore 34 through the passages 62 and 66. For these reasons, the specification and drawings do support the limitation of Claim 12, to which the Office action refers. The specification has been amended to state that no differential pressure exists across valve 38, rod 62 and plunger 52 due to the presence of the axial passage in valve 38 and axial passages 64, 66, although the specification, as originally filed, supports the subject claim limitation now present in each pending claim.

Claims 2, 4, 5, 7, 8, 10-14 stand rejected under 35 U.S.C. 103(a) as unpatentable over Fujimura et al. (U.S. 5,860,797) in view of Yokota et al. (U.S. 6,041,883). The claims recite a spring seated against displacement relative to the housing at the first end and seated against the actuator at the second end. The valve of the '883 patent is a balance valve having a coil 4 for changing the force produced by spring 17 and applied to the valve spool 14. Spring 17 contacts the slide 36 and the valve spool 14. Spring 17 is neither seated against axial displacement relative to the housing at its first end, nor secured by the housing against axial displacement relative to the housing, as the claims recite. Instead, spring 17 is free to move with the spool 14 and slide 36 relative to the housing. Neither the '883 patent nor the '797 patent discloses, teaches, or suggests the spring recited in the claims of this application.

The valve of the '883 patent is a balance valve having a coil 4 for changing the magnitude of the force of spring 17, which is applied to the valve spool 14. But the valve of the present application is not a balance valve; the force produced by the coil is directly applied to the spool. The electromagnetic force of the '833 patent adds to the force of spring 17 tending to move the spool 14 leftward and to open the bypass 19, whereas in the claimed invention the force of spring 68 is opposed to the electromagnetic force produced by coil 54. The claims, as amended, define the invention in these terms.

The device of the '797 patent has no electromagnetic actuation, and no spring comparable to those discussed above. The valve of the '797 patent is a balance valve that moves in response to discharge pressure at the right end of the bore, pressure on right side of land 16b of spool 16, the force of spring 17, and feedback pressure in chamber 23 at the left side of the bore. The principle of its control and actuation is entirely different from that of the present invention, as the Office actions have acknowledged.

Each independent claim, Claims 11, 12 and 13, recites that the plunger responds to external forces, except a differential hydraulic pressure force across the plunger tending to displace the plunger axially. In the device of the '883 patent, feedback pressure carried in passages 24, 21 and 25 to chamber 16 adds to the force of

spring 17 and slide 36 to move the spool 14 leftward and to close the bypass 19. The variable electromagnetic force on slide 36 compensates for variations in the feedback pressure. Claims 11, 12 and 13 say that no hydraulic pressure moves the valve. Neither the '883 patent nor the '797 patent discloses, teaches, or suggests actuation of the spool as recited in claim 12 of this application, i.e., without hydraulic pressure actuation.

Claim 13 recites that the electromagnetic field tends to close the inlet of the bypass port, the plunger being axially displaceable along the axis in response to the electromagnetic field and a force produced by the spring tends to open the inlet of the bypass port, but no differential hydraulic pressure is applied to the valve. In the device of the '883 patent, spring 17 and the electromagnetic force both tend to close the bypass 19. Neither the '883 patent nor the '797 patent discloses, teaches, or suggests actuation of the spool as recited in claim 13 of this application.

In view of the foregoing amendment and remarks, the claims remaining in this application appear now in condition for allowance. Favorable action is respectfully solicited.

Respectfully submitted,



Frank G. McKenzie  
Attorney for Applicant(s)  
Reg. No. 29,242

MacMillan, Sobanski & Todd, LLC  
One Maritime Plaza, Fifth Floor  
720 Water Street  
Toledo, Ohio 43604  
(734) 542-0900  
(734) 542-9569 (fax)